

REMARKS

Entry of the foregoing and reconsideration of the application identified in caption, as amended, pursuant to and consistent with 37 C.F.R. §1.111 and in light of the remarks which follow, are respectfully requested.

By the above amendments, claims 2, 11 and 12 have been canceled without prejudice or disclaimer. The subject matter of claims 2 and 12 has been incorporated into each of independent claims 1 and 29. The remaining dependent claims have been amended consistent with such amendments to the independent claims. Claims 3, 5 and 13 have been amended to depend from claim 1. Claim 15 has been amended for readability purposes by deleting the redundant term "potassium bicarbonate." Claim 27 has been amended for clarification purposes, and now recites that step (b) is effective to raise the pH at the surface of the mushrooms to a pH of 6.2 to 6.8. Support for this amendment can be found in the instant specification at least at page 10, lines 1-4. New dependent claims 32 and 33 recite that the first and second aqueous solutions are contacted with the mushrooms by spraying the solutions. Support for such new claims can be found in the instant specification at least at the paragraph bridging pages 7 and 8, taken in connection with page 11, lines 1-3.

In the Official Action, claims 1-31 stand rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent Application Publication No. 2003/0198716 (*Hankinson et al*) in view of U.S. Patent No. 5,912,034 (*Martin et al '034*), or *Martin et al '034* in view of *Hankinson et al*, further in view of U.S. Patent No. 4,814,193 (*Shenouda et al*), U.S. Patent No. 3,328,178 (*Alderton*), Great Britain Patent Document No. 1,510,883 (*GB '883*), and U.S. Patent No. 1,098,006 (*Allen*), further in view of U.S. Patent No. 6,500,476 (*Martin et al '476*), U.S. Patent No. 5,919,507 (*Beelman et al '507*), U.S. Patent Application Publication No. 2003/0170354 (*Beelman et al '354*), U.S. Patent No. 4,814,192 (*Sapers et al*), U.S. Patent

No. 4,011,348 (*Farrier et al*), and U.S. Patent No. 6,159,512 (*Reyes*). Withdrawal of this rejection is respectfully requested for at least the following reasons.

According to exemplary aspects, independent claims 1 and 29 are directed to methods for preserving mushrooms. Applicants respectfully submit that among the various food products which can benefit from preservation treatment, mushrooms are unique in their surface characteristics and sensitivities to treatment chemicals. Applicants have surprising and unexpectedly discovered that excellent aerobic plate count reduction, color and shelf life characteristics can be attained by employing the inventive methods, for example, in which the mushrooms are contacted with a first aqueous solution comprising a pH-adjusting agent effective to adjust the pH of the first aqueous solution to about 1.5 to 4.5, for about 15 to 60 seconds, and then the mushrooms are contacted with a second aqueous solution comprising a chelating agent and an antioxidant, wherein the second aqueous solution has a pH of about 7.0 to 9.0. In this regard, the Examiner's attention is directed to the experimental data concerning aerobic plate count reduction, color and shelf life characteristics, set forth at pages 17-29 of the instant specification.

Hankinson et al relates to a system and method of maintaining the integrity of freshly harvested, or freshly cut fruits and vegetables (paragraph [0002]). The method can include an antimicrobial/anti-pathogen treatment consisting of either treatment with simultaneous or sequential application of ozonated water by an ozone treatment system and ultraviolet light by an ultraviolet light system (paragraph [0052]).

In making the above §103(a) rejection, the Patent Office has relied on *Hankinson et al*'s discussion in the "Background" section concerning the use of highly basic and acidic solutions in the treatment of fruits and vegetables. However, upon a fair and complete reading, it is apparent that the disclosures relied on by the Patent Office in fact teach away

from employing a first aqueous solution comprising a pH-adjusting agent effective to adjust the pH of the first aqueous solution to about 1.5 to 4.5, as is recited in independent claims 1 and 29.

In this regard, *Hankinson et al* discusses the use of chemical compounds and in particular highly basic and acidic solutions in the treatment of fruits and vegetables in the Background section thereof. Notably, *Hankinson et al* discloses in great detail various technical problems, risks and disadvantages associated with the use of such highly basic and acidic treatment solutions. Specifically, *Hankinson et al* teaches the following: "[i]f mushroom tissue is not sufficiently neutralized browning can be induced by this treatment due either to cellular damage, or subsequent susceptibility to microbial attack" (paragraph [0007]); use of such solutions "may be too expensive for commercial implementation and the use of a highly basic solution may be quite dangerous if workers are not sufficiently skilled" (paragraph [0007]); "[t]his technology requires storage and handling of dangerous chemicals, and may be fraught with disposal and environmental issues associated with acidic and basic solutions including as death of beneficial bacterial in leech field and/or settling ponds" (paragraph [0008]); "there is potential for microorganisms on mushrooms to become tolerant to such chemical technology" (paragraph [0008]); "without proper neutralization, residual acidity can result in damaged tissue that is more susceptible to pathogenic degradation." (paragraph [0015]); and "it is possible, and probable that microbes will become resistant to such treatment" (paragraph [0015]).

Thus, while *Hankinson et al* discusses the use of highly basic or acidic treatment solutions, it is only to disparage such practice by pointing out the technical problems, risks and disadvantages associated therewith. Quite clearly, in view of such teaching away from the use of highly basic or acidic solutions, one of ordinary skill in the art would not have been

motivated to employ such solutions in the suggested manner. Doing so would have been in complete contradiction with the express admonitions and teachings of *Hankinson et al.* In fact, a disclosed objective of *Hankinson et al* is to overcome the very drawbacks and disadvantages associated with the use of highly basic or acidic solutions. Simply put, *Hankinson et al*'s disclosures would not have motivated one of ordinary skill in the art to employ a highly basic or acidic treatment solution in the suggested manner.

Furthermore, it is well established that it is improper to combine references where the references teach away from their combination. *See In re Grasselli*, 713 F.2d 731, 743 (Fed. Cir. 1983). As discussed above, *Hankinson et al* teaches away from the use of highly basic and acidic solutions in treating fruits and vegetables. However, the Patent Office has combined *Hankinson et al* with other applied art which employ highly basic and acidic treatments. Such alleged combination is clearly improper. In fact, *Beelman et al '507* and *Martin et al '476* which have been relied on by the Patent Office, are explicitly cited and disparaged by *Hankinson et al*. As such, in view of such teachings, one of ordinary skill in the art would not have been motivated to combine *Hankinson et al* with the applied art in the manner suggested by the Patent Office.

Martin et al '034 fails to disclose or suggest each feature recited in independent claims 1 and 29. for example, *Martin et al '034* does not disclose or suggest a method for preserving mushrooms, comprising contacting the mushrooms with first and second aqueous solutions. *Martin et al '034* relates to processing raw, peeled potatoes, and is not concerned at all with the preservation of mushrooms (col. 1, lines 6-7; col. 2, lines 30-41). As discussed above, mushrooms are unique in their surface characteristics and sensitivities to treatment chemicals. As such, absent an improper resort to Applicants' own disclosure, no motivation

would have existed to employ the processes intended for raw, peeled potatoes, in the preservation and treatment of mushrooms.

Furthermore, *Martin et al '034* fails to disclose or suggest contacting the mushrooms with a first aqueous solution comprising a pH-adjusting agent effective to adjust the pH of the first aqueous solution to about 1.5 to 4.5, wherein the contact between the mushrooms and the first aqueous solution is effective to reduce a microbial concentration on the mushrooms, wherein the mushrooms are contacted with the first aqueous solution for about 15 to 60 seconds, as recited in claims 1 and 29. By comparison, *Martin et al '034* discloses dipping peeled potatoes in a heated organic acid dip for 3 to 10 minutes (col. 3, lines 9-21). The purpose of such heated organic acid dip is to lower polyphenol oxidase activity in the surface tissue of the peeled potatoes (col. 3, lines 21-27). There is simply no recognition of employing such heated organic acid dip to reduce a microbial concentration, let alone on mushrooms. As such, one of ordinary skill in the art would not have been motivated to modify *Martin et al '034* to contact the mushrooms with the recited first aqueous solution, wherein the contact between mushrooms and the first aqueous solution is effective to reduce a microbial concentration on the mushrooms, and wherein the mushrooms are contacted with the first aqueous solution for about 15 to 60 seconds.

The Patent Office has relied on *Shenouda et al*, *Alderton*, *GB '883* and *Allen* for disclosing low acid treatment followed by a neutralizing step (Official Action at page 2). *Shenouda et al* relates to a process which employs a pH shock using an extreme acid and extreme base to accomplish log reduction (col. 3, lines 57-59). *Alderton* relates to a process for sensitizing microbial spores to heat so that in a later stage of the process they can be destroyed by the application of heat sterilization (col. 3, lines 51-55). *GB '883* relates to a three-step blanching process of raw food products (paragraph bridging pages 1 and 2). *Allen*

relates to a process of preserving fruit and vegetable pulps by the introduction of an antiseptic material into the food substance (left col., lines 9-21).

In this regard, like *Martin et al '034*, none of the above applied documents relate to the preservation of mushrooms, as now recited in independent claims 1 and 29. As discussed above, mushrooms are unique in their surface characteristics and sensitivities to treatment chemicals, and no motivation would have existed to employ processes intended for different materials in the preservation of mushrooms. Furthermore, like *Martin et al '034*, such applied documents fail to disclose or suggest contacting the mushrooms with the first aqueous solution for about 15 to 60 seconds.

With further regard to *Shenouda et al*, it is noted that such document discloses the use of a second aqueous medium having a pH ranging from about 11 to about 13 which "is not a neutralizing step but rather a transfer from a acidic medium to an alkaline medium, creating a pH shock about the surface of the food material" (col. 3, lines 6-9). *Shenouda et al* further discloses that "[t]he pH shock at extreme acid and extreme base is what is necessary to accomplish the log reduction" (col. 3, lines 57-59). Since *Shenouda et al* requires a pH shock treatment with an extreme base, and distinguishes such pH shock treatment from a neutralizing step, one of ordinary skill in the art would not have been motivated to combine same with *Martin et al '034* which employs a weakly basic solution with the express purpose of neutralizing the potato surface (col. 2, lines 46-48).

The Patent Office has also relied on *Martin et al '476*, *Beelman et al '507*, *Beelman et al '354*, *Sapers et al*, *Farrier et al*, and *Reyes* for disclosing the use of chelating agents and antioxidants in preserving produce (Official Action at page 3). However, such secondary applied art fails to cure the deficiencies of the other applied art discussed above. Further, it is noted that *Beelman et al '507* and *Martin et al '476* are discussed in the Background section

of Applicants' disclosure. As set forth therein, employing a high-pH solution having a pH of about 9.5 or higher as an antimicrobial wash in the manner described in such documents typically does not consistently yield whole mushrooms having an acceptable appearance after later stages of storing. Moreover, such documents do not disclose or suggest the mushroom preservation methods recited in the claims.

For at least the above reasons, it is apparent that no *prima facie* case of obviousness exists. Accordingly, withdrawal of the above §103(a) rejection is respectfully requested.

Claims 1, 4-11, 14, 17-21, 24, 25 and 27-31 stand rejected under 35 U.S.C. §102(b) as being anticipated by *Martin et al '034*. Without addressing the propriety of the Examiner's comments, it is noted that the subject matter of claims 2 and 12 has been incorporated into each of independent claims 1 and 28. Claims 2 and 12 have not been listed in the above §102(b) rejection and as such, this rejection is now moot. Accordingly, for at least this reason, withdrawal of the rejection is respectfully requested.

From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order, and such action is earnestly solicited. If there are any questions concerning this paper or the application in general, the Examiner is invited to telephone the undersigned.

Respectfully submitted,

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